Biological Opinion for the Issuance of a Section 10(a)(1)(B) Incidental Take Permit for the take of Piping Plover (*Charadrius melodus*) in Leelanau County, Michigan

February 2001

Prepared by: Jennifer Szymanski, Regional Section 7 Coordinator
Region 3, Fort Snelling, Minnesota

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion for the proposed issuance of a section 10(a)(1)(B) permit allowing the incidental take of piping plover (*Charadrius melodus*) in Leelanau County, Michigan. This biological opinion documents the likely effects on piping plover and pitcher's thistle (*Cirsium pitcheri*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*.).

This biological opinion is based on information provided in the Incidental Take Permit, the accompanying draft Environmental Assessment (EA)/Habitat Conservation Plan (HCP) and draft Implementing Agreement (IA), numerous telephone conversations, and other sources of information. A complete administrative record for this consultation is on file at the Division of Endangered Species, Regional Office, Fort Snelling, Minnesota.

CONSULTATION HISTORY

April 23, 1998 – Northern Ecological Services (NES), on the behalf of the Petty family, provides a letter to the East Lansing Field Office (ELFO) requesting information regarding the potential effects on piping plover from the proposed subdivision and development of the Petty family property (Magic Carpet Woods Project).

May 12, 1998 – ELFO responds to NES' April 23, 1998 letter explaining anticipated effects of proposed project on piping plovers.

June 10, 1998 – Mr. David Bieganowski (Blakeslee, Chambers & Peterson, P.C.) submits a Freedom of Information Act (FOIA) request to the Service. The request includes copies of all correspondence received or sent by the Service concerning the Cathead Bay and surrounding area as it relates to any endangered species or critical habitat.

June 15, 1998 – Service responds to a June 10, 1998 FOIA request by Mr. David Bieganowski.

June 17, 1998 – NES requests a meeting with the ELFO.

June 22, 1998 – ELFO personnel meet with Leelanau Township staff to discuss the Magic Carpet Woods Project.

June 25, 1998 – ELFO submits comments for the Leelanau Township Zoning hearing. The Service's opinion regarding anticipated effects of the Magic Carpet Wood Project are explained.

June 25, 1998 – Kohler & Black, PLC submits FOIA request for all correspondence received, or sent by the Service, concerning the Cathead Bay and the surrounding area as it relates to any endangered species or critical habitat.

June 25, 1998 – ELFO responds to Kohler & Black June 25, 1998 FOIA request.

June 29, 1998 – NES provides additional information regarding the proposed project and responds to concerns expressed by the ELFO.

July 1, 1998 – ELFO provides Mr. Petty a letter regarding the Service's Piping Plover Protection Plan and an explanation of why such procedures would provide insufficient protection to piping plovers for the Magic Carpet Woods Project.

July 1, 1998 – William Fulkerson (Warner Norcross & Judd, LLP) requests in writing, on the behalf of the Petty family, a meeting with ELFO to discuss the Magic Carpet Woods Project.

July 7, 1998 – ELFO provides a clarification letter to Leelanau Township further explaining the ELFO's comments regarding the Magic Carpet Woods Project in its June 25, 1998 letter.

July 14, 1998 – ELFO responds to Mr. Fulkerson's July 1, 1998 letter regarding their concerns about the possibility of incidental take of piping plovers.

July 17, 1998 – ELFO meets with Ms. Deb Brown (Leelanau Township), Mr. Al Ammons (Michigan DNR, Parks and Recreation), Dr. Francie Cuthbert (University of Minnesota), Mr. Petty, and Mr. Rick Whitney and Mr. Tim Cypher (ecological consultants for Mr. Petty).

August 27, 1998 – Mr. Michael Brennan (Holland and Hart, Attorneys at Law), on the behalf of the Petty family, requests copies of biological opinions and section 10 incidental take permits involving the Great Lakes piping plover.

September 18, 1998 – ELFO responds to Mr. Brennan's request for information regarding section 10 permits and section 7 biological opinions.

October 2, 1998 – ELFO provides comment on five Michigan Department of Environmental Quality applications for permit for Alteration and Construction in High Risk Erosion Areas and Critical Dunes required for the Magic Carpet Woods Project. The Service explains that incidental take is likely as a result of the proposed project.

October 20, 1998 – Mr. Brennan responds to ELFO's October 2, 1998 letter. The letter explains the status of Mr. Petty's efforts in developing a natural resources protection plan for the proposed project, and request further explanation of why the Service believes that incidental take of piping plover is likely.

November 20, 1998 – ELFO responds to Mr. Brennan's October 20, 1998 request for explanation of how the proposed project would result in take of piping plover. The anticipated impacts are explained and Mr. Petty is informed that submitting a section 10 incidental take permit may be prudent.

February 9, 1999 – Mr. Whitney provides a draft Protection Plan for the proposed Magic Carpet Woods Project which includes an analysis of project effects.

March 19, 1999 – ELFO responds to Mr. Whitney's February 9, 1999 letter and draft plan. The Service reiterates concerns and issues raised in the November 20, 1998 letter.

March 29, 1999 – Mr. Whitney provides a revised Protection Plan for the proposed Magic Carpet Woods Project with Dr. Francie Cuthbert's comments incorporated.

March 30, 1999 – Mr. Brennan contacts T.J. Miller, Chief, Division of Endangered Species, alerting the Service that neither he nor his client, Mr. Petty, understand the Service's position that incidental take is likely. As a result, Mr. Brennan believes it would be helpful for him to meet with the Region 3's Field Solicitor.

April 1, 1999 – Mr. Brennan responds to ELFO's March 19, 1999 letter and submits their "Revised Resources Preservation and Protection Plan Magic Carpet Woods Section 14, Leelanau Township, Leelanau County." He also reiterates that they disagree that incidental take is likely. They request a meeting with the Service.

May 7, 1999 – Ms. Ellen Kohler (Kohler & Black, PLC) submits a FOIA request for any documents and communications between (1) the Service and Leelanau Township or Leelanau Township Planning Commission regarding any properties in the Cathead Bay area, (2) the Service and the Petty Family or their representatives, attorneys or consultants, and (3) any information regarding the piping plovers or other listed or candidate species in the Cathead Bay area.

May 17, 1999 – Service responds to a FOIA request from Ms. Kohler.

May 28, 1999 letter – ELFO responds to Mr. Brennan's April 1, 1999 letter and attached Protection Plan. The Service reiterates that proceeding with the proposed project as planned would result in take of piping plovers.

June 10, 1999 – ELFO receives letter from Mr. Brennan responding to the Service's May 28, 1999 letter. They reiterate their concern that current data do not indicate that incidental take is likely and request a meeting with the Service.

June 30, 1999 – ELFO meets with Mr. Petty, Mr. Brennan, and Mr. Whitney regarding the proposed Magic Carpet Woods Project.

July 11, 1999 – Mr. Whitney provides a follow-up letter to the June 30, 1999 meeting. On behalf of Mr. Petty, Mr. Whitney addressed three issues that required resolution: (1) the Service's understanding of the project, (2) the Service's assertion that take will occur, and (3) proposed measures to mitigate presumed impacts so that take will not occur.

July 12, 1999 – Mr. Whitney provides updated piping plover information to ELFO. Dr. Cuthbert's crew did not document plover use on the Petty property. Mr. Whitney states that such information strongly supports their position that residential use of the property will not result in take of the species.

July 26, 1999 – Ms. Paula Fleck (Holland & Hart, Attorney at Law) submits a FOIA request on behalf of the Petty family.

August 11, 1999 – ELFO responds to Mr. Brennan's June 10, 1999 and Mr. Whitney's July 11 and 12, 1999 letters.

August 23, 1999 – ELFO responds to Ms. Fleck's July 26, 1999 FOIA request.

September 9, 1999 – Mr. Murray D. Feldman (Hollard & Hart, Attorneys at Law), on behalf of the Petty family, confirms the date for a site visit and a meeting to discuss the Magic Carpet Woods Project.

September 24, 1999 – ELFO meets with Mr. Petty, Mr. Whitney, and Mr. Feldman to discuss the Magic Carpet Woods Project.

December 6, 1999 – Mr. Feldman, on the behalf of the Petty family, submits a draft EA/HCP to ELFO.

January 14, 2000 – Ms. Kohler alerts U.S. Department of Interior, Office of the Field Solicitor, of road construction activities initiated by the Petty family. Ms. Kohler indicates that as the ELFO has documented that the proposed project is likely to result in incidental take of piping plover, she is concerned about these activities. She requested a written explanation of how the Service intends to address this situation.

January 18, 2000 – ELFO responds to Ms. Kohler's January 14, 2000 letter informing her that the Service is currently coordinating with the Petty family in developing a conservation plan for the protection of piping plover on the property.

February 14, 2000 – ELFO provides comment on the December 6, 1999 draft EA/HCP to Mr. Feldman.

March 29, 2000 – Mr. Feldman, on the behalf of the Petty family, submits a section 10(a)(1)(B) incidental take permit application to the Service. The application package included a completed Incidental Take Permit Application, certified check in the amount of $25.00, a draft EA/HCP, and a draft IA.

April 20, 2000 – The Service publishes in the *Federal Register* a Notice of Receipt of the Petty permit application and draft EA/HCP. Written comments are solicited and accepted through May 22, 2000.

November 6, 2000 – Mr. Feldman, on the behalf of the Petty family, submits a revised draft EA/HCP to the Service.

November 13, 2000 - The Service publishes in the *Federal Register* a Notice of Receipt of a revised draft EA/HCP. Written comments are solicited and accepted through December 13, 2000.

November 13, 2000 – The Service (Regional Permits Coordinator) submits a complete initiation package and initiates formal consultation (to the Regional Section 7 Coordinator).

December 21, 2000 – The Service publishes in the *Federal Register* a Notice extending the comment period to January 22, 2001.

In addition to the above correspondence, there were numerous telephone communications between the ELFO and Mr. Petty and his legal counsel and consultants.

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the issuance of a section 10(a)(1)(B) incidental take permit (ITP) for the incidental take of piping plover. The Petty family has created a site-condominium (Magic Carpet Woods) with 13 lake front lots, which will be sold for construction and occupancy of single family residences. The Magic Carpet Woods property (Property) extends for 1/2 mile (2, 600 ft/0.8 km) along the Cathead Bay shoreline of Lake Michigan in Leelanau County, Michigan. Per the Endangered Species Act of 1973 (Act), as amended, and its implementing regulations, the applicant, Magic Carpet Woods Association, submitted an ITP application and the required draft HCP to the Service on March 29, 2000. As indicated in the Consultation History, the HCP underwent additional modification and environmental analysis to reach its final form. The purpose of the ITP is to allow incidental take of piping plover resulting indirectly from construction and occupation of 13 houses on the Property. The permit term is for a period of 25 years.

The Property will be managed as a site condominium per a Master Deed under the Michigan Site Condominium Act. All owners of units in the site condominium will be members of the Magic Carpet Woods Association (Association), a nonprofit corporation organized to manage, administer, and maintain the Magic Carpet Woods site condominium. The Association created by the Magic Carpet Woods Development Master Deed and referenced bylaws will implement the conservation measures listed in HCP. The Association will use its regulation adopting power, as set out in Section 6.6 of its bylaws, to enact the conservation measures called for in the HCP that are not already incorporated into the Master Deed and Association Bylaws. Participation in the Association will be required through the deeds associated with each lot. The Association will have a single point of contact for interaction and information exchange with the Service. The Association will consist of the 13 homeowners with Lake Michigan access. Lot 14, which has no frontage on or access to Lake Michigan, will not be part of the Association.

The submitted draft HCP identifies conservation measures the Applicant intends to implement for the purposes of minimizing and mitigating incidental take that may occur in the future. A summary of the proposed conservation measures is provided below (see HCP for additional information). The primary goal of the HCP is to address human activities so that human alteration of this habitat is avoided and natural use of the beach by piping plovers is allowed to occur.

1. An 80-foot protective setback from the ordinary high water mark of Lake Michigan will be established. This setback area will remain in its natural state except for the possible placement of posts for a deck on each homesite no closer than 65 feet from the ordinary high water mark, and the placement of one walkway structure or pathway to the beach for each homesite, as necessary, to allow safe access to the beach.

2. Construction of boardwalks or walkways along the shoreline will be located from the forest to the crest of the foredune as needed to safely access the beach and create a single access lane to minimize human-caused dune alteration.

3. Towering structures such as flagpoles, antennas, and satellite dishes are not allowed within the shoreline area. Activity platforms, which typically contain grills and picnic tables, are not allowed along any portion of the shoreline. No satellite dishes are allowed from the shoreline through the open dune area. No bird or animal feeders are allowed from the shoreline through open dune area.

4. Removal or planting of vegetation in the active dune area is prohibited. Disturbance to the existing active dune area through alteration of sand, gravel, rocks, water, or plants is also prohibited.

5. Major construction activities (e.g., construction of homes or attendant buildings) will be completed prior to limited removal of trees and shrubs lying between houses and the shoreline.

6. Pets must be restrained or under direct control (i.e. with electric or invisible fencing) at all times. Pets must always be on a leash when on the beach during the critical nesting period. This period will run from April 15 through June of each year, or until all piping plover chicks hatched from nests on or within 0.5 miles of the Property are 35 days old.

7. Stray dog sightings detected by an on-site steward will be immediately reported to appropriate animal control or law enforcement entities (i.e., the Service, county animal control office, or a Michigan Department of Natural Resources (DNR) Conservation Officer).

8. Access to the beachfront of the Property by the Service or DNR representatives to observe or monitor piping plovers will be permitted provided reasonable notification of the timing and extent of the survey(s) is given to the primary contact of the Association. The Service or DNR representatives will be provided access to the entire beachfront owned by members of the Association.

9. All occurrences, if any, of piping plovers on the Property as detected by monitoring provided or supported by the Association or other sources will be timely reported to the Service.

10. Garbage will be placed in covered animal-proof containers that will be stored year-round in an area within the forest to minimize attracting potential plover predators to the beach. Garbage or unenclosed food will not be left unattended along the shoreline.

11. The Association will participate in current Service-endorsed monitoring efforts and allow monitoring team access to the Property shoreline. This existing monitoring program will expand its current efforts to include the Property, thereby providing information in the

same format and detail that is currently provided to the Michigan Department of Natural Resources Endangered Species Program and to the Service.

12. In the event the existing monitoring program discontinues its efforts sometime in the future or if its efforts do not include the Property, the Association will identify and use, in coordination with the Service, other monitoring programs in Cathead Bay (e.g. by the State Park or the Michigan DNR), and ensure continued biological monitoring. If no existing or ongoing monitoring programs are available for cooperative efforts, the Association will contract with a qualified consultant, in coordination with the Service, to perform seasonal biological monitoring.

13. Biological monitoring and protection will occur between the last week in April and the end of June or until all piping plover chicks hatched from nests on or within 0.5 miles of the Property are 35 days old. (Monitoring includes the process of searching for nests in the Cathead Bay area.) The total amount of time spent monitoring the Property and the daily and weekly distribution of monitoring will be in accordance with the current protocol used for the existing piping plover monitoring program. Monitoring and protection will conclude on June 30 if no nesting occurs on or within 0.5 miles of the Property.

14. The Association will provide suitable funding to cover the incremental expenses associated with extending the existing monitoring program to the Property.

15. Piping plover nests found on the Property will be accorded the same protection from disturbance and predation provided to nests on public property in the Great Lakes region. Plover monitors or stewards will be permitted to erect predator exclosures and close the surrounding beach area to human entry with psychological fencing. The closed, fenced area will extend about 100 m beyond each nest and parallel to the shoreline and from the toe of the foredune to the waterline. During the approximately 30-day period a nest is being incubated, human traffic may pass the nest by walking between the lake waterline and the fencing. During nest incubation and the rearing period prior to chick fledging, the Association will maintain regular daily or near daily contact with the plover steward/monitor to keep informed of brood movements and behavior.

16. The Association will ensure that an on-site steward is present to aid in creation and maintenance of nest exclosures (if required), discourage human, pet, and predator activities near nest sites, and help educate homeowners of plover issues. Similarly to biological monitoring, the Association will, to the extent possible, work with the existing stewardship program conducted by the Michigan Department of Natural Resources, Wildlife Division.

17. The Association will provide suitable funding to cover incremental expenses associated this existing stewardship program. The Association will be responsible for ensuring stewardship activities are conducted on the Property only if plovers are observed nesting on or within 0.5 miles of the Property. Stewardship activities will commence the last

week in April and continue through the end of June of each year or until all piping plover chicks hatched are 35 days old.

18. In the event the existing stewardship program discontinues its efforts or its efforts do not include the Property, the Association will, in coordination with the Service, work with other stewardship programs in Cathead Bay (e.g. by the State Park) or will contract with a qualified individual to provide these services for the Property.

19. As per deed restrictions, lot owners are required to permit the construction and maintenance of exclosures around plover nests on their property as deemed appropriate and necessary by the plover stewardardship program. Lot owners will not be individually responsible for constructing, maintaining, or funding such exclosures.

20. Off-road vehicles or any other motorized vehicles will not be permitted in the active dune area or beachfront at any time. Use of jet skis by Association members, lessees and guests will be restricted during the critical nesting period.

21. At the conclusion of each breeding season, members of the Association will be required to contribute an annual assessment to the Association in order to cover expenses incurred as part of the plover monitoring, protection and mitigation program. The cost will be determined, in coordination with the Service, once the expenses for the monitoring program are determined.

22. Lot owners are required to advise all visitors, renters and lessees of the plover protection measures and restrictions in the HCP and related documents, including the Master Deed and Association Bylaws. Lot owners will have ultimate responsibility for ensuring visitors, renters, and lessees comply with measures contained in these documents.

23. During the critical nesting period, picnics will not be allowed on the beach if nesting is known to occur within 0.5 miles of specific lots unless the picnic area is promptly cleaned up and policed at the conclusion of the picnic. No picnics or any activities (except for fencing and exclosure installation, removal, or maintenance or other nest or piping plover protection or monitoring activities) are allowed in a fenced nesting area. Kite flying, fires, use of fireworks and firearms will not be allowed during the critical nesting period.

24. For any road and home construction activities that may occur during the nesting/breeding season, the lot owner is required to inform any contractor and all employees that they are not allowed on the beach, no pets are allowed at the construction site, and all trash must be properly disposed of in secure containers. The requirement of each lot owner to undertake this step will be expressly identified in the deed to each lot.

25. If the MDNR, Service, Association, plover steward(s), or biological monitor(s) determine (1) that mammalian predators (excluding dogs and cats) pose a threat to plovers in the Property vicinity, (2) that the predators should be removed from the area or exterminated, and (3) that an effective means of removing or exterminating the predators is to use the

Property for such purposes, then the Association will allow the MDNR, Service, or a mutually agreed upon party to access the Property to conduct trapping/exterminating activities. The Association will be responsible for expenses associated with predator removal/extermination if it is reasonably determined by the MDNR, Service, plover steward(s) or biological monitor(s) that activities occurring as a result of the Magic Carpet Woods Project are primarily responsible for occurrence of the predators.

In the event that plovers do not nest along Cathead Bay by June 30 in any given year, homeowners and the Association will not be required to adhere to the measures relating to behavioral modifications (i.e. restrictions on picnics and control of pets). Likewise, the Association will not be responsible for conducting biological monitoring or stewardship activities beyond June 30 if nesting does not occur along the bay by that date.

The Applicant is responsible for ensuring implementation and compliance with the conservation measures in the ITP and the HCP. Specifically, the Association will (1) implement the conservation measures identified in the HCP through bylaws and deed restrictions, (2) monitor lot owner compliance with the conservation measures, and (3) implement prompt corrective action to remedy any non-compliance observed. The Association will ensure implementation and compliance with the terms of the ITP. Members and guests will be verbally alerted if such terms are violated. If prompt remediation does not occur, the Association will notify the Service. Failure to abide by these processes may result in non-compliance with the ITP and the Association or individual lot owners could be subject to section 9 enforcement and incur section 11 penalties.

In addition, the Association will contribute $1,000 (not to exceed $13,000) at the time each of the 13 lots is first sold or ownership is transferred. These monies will be invested in a trust account, (which will accept subsequent funds from other sources) with the balance and income from the trust account to be used to fund piping plover research, monitoring, or recovery efforts conducted in the Great Lakes region. The trust proceeds will be forwarded to a qualifying educational or charitable institution mutually agreed to by the Association and the Service. The Service will approve all use of such funds.

"Action area" is defined as all areas that will be affected directly or indirectly by the Federal action (502 CFR §402.02). The area affected by this proposed project (i.e., action area) is the entire shoreline of Cathead Bay. Piping plover occurs primarily at 3 locations in Michigan; Upper Peninsula, northwestern lower Michigan, and Sleeping Bear Dunes. Plovers from these Great Lakes locations are highly mobile and intermix and interbreed freely. The Sleeping Bear Dunes (SBD) population is localized in 3 areas; mouth of Platte River, North Manitou, and Cathead Bay. The Property is situated on Cathead Bay in section 14, township 32N, range 11W in Leelanau County, Michigan. Cathead Bay is part of the Leelanau Peninsula and occurs along the northwestern lower Michigan shore. The northern limit of Cathead Bay is called Lighthouse Point. The beach for about one mile south of Lighthouse Point, is rocky, narrow and unsuitable for piping plover. South of this point, sand beach stretches southwesterly along Lake Michigan to a small promontory called Cathead Point. This shoreline between Lighthouse Point and Cathead Point is known as Cathead Bay (Michigan Natural Areas Council 1978).

Piping plovers that may use the Property during the nesting period would be part of the Cathead Bay local population, i.e., are likely to nest and forage elsewhere along Cathead Bay as well. As such, activities that affect plovers using the Property will ultimately impact the entire Cathead Bay population. Thus, the action area for this proposed action includes the entire shoreline of the Cathead Bay.

STATUS OF THE GREAT LAKES PIPING PLOVER POPULATION & ITS CRITICAL HABITAT

Unless noted otherwise, all information is cited from U.S. Fish and Wildlife Service (1994) and references within. This section is a discussion of the Great Lakes population of piping plovers and their proposed critical habitat. It includes information on the species' life history, its habitat and distribution, and past human and natural factors that have led to the current status of the species.

Species & critical habitat description for the Great Lakes piping plover population

Piping plovers are small North American shorebirds approximately 17 cm in length and weigh 40-65 grams. The bird's light sand colored plumage with white undersides, is perfect camouflage for its beach habitat. Further description and taxonomic information is provided in U.S. Fish and Wildlife Service (1994 and 1996).

Piping plovers occur in three distinct breeding populations (Dr. Francesca J. Cuthbert, University of Minnesota, *in litt.* 2000 February 7): beaches of the Atlantic Coast, shorelines of the Great Lakes, and along alkali wetlands and major rivers of the Northern Great Plains. The American Atlantic and Northern Great Plains populations are listed as threatened while the Great Lakes population is classified as endangered. Piping plovers while migrating and at the wintering sites are considered threatened under the Act.

The piping plover was federally listed endangered on January 10, 1986 (50 *FR* 50726). The factors causing the need for Federal protection include habitat destruction, disturbance by humans and pets, high levels of predation, and contaminants. A Great Lakes/Northern Great Plains recovery plan was published in 1988. In 1994, a revised technical/agency draft recovery plan was published, but prior to finalization, the Service decided to develop separate plans for the two populations. Both recovery plans are currently under development. The current recovery goal for the Great Lakes population is 150 breeding pairs.

On July 6, 2000, the Service published a proposed rule to designate critical habitat for the Great Lakes piping plover population (65 *FR* 41812). Thirty-seven critical habitat units are proposed within the Great Lakes region, including 23 in Michigan. The purpose of critical habitat is to specify those areas that are essential for the conservation of the species or those areas that require special management consideration. The term "conservation" is defined by the Act as the use of all methods and procedures that are necessary to bring a listed species to the point at which listing under the Act is no longer needed. Thus, critical habitat areas are to provide sufficient habitat to support the species at the population level and the geographic distribution that is necessary for recovery. The proposed designation for piping plover encompasses the areas considered necessary to achieve the recovery goals for the Great Lakes population (i.e., those areas necessary to meet the recovery criteria of 100 breeding pairs in Michigan and 50 pairs in

the other Great Lakes states). Specifically, the critical habitat units include Great Lakes shoreline and island beaches that (1) recently or currently support nesting piping plovers, (2) have historically supported and are still capable of providing suitable nesting habitat, or (3) are currently unoccupied but provide some or all of the essential habitat components for nesting birds or have the capacity to develop these habitat components.

Although these 37 units encompass broad areas throughout the Great Lakes region, only the specific locations within the units that have or could develop the physical and biological features required by piping plovers (referred to as primary constituent elements) would be considered critical habitat. The proposed primary constituent elements (PCEs) for the Great Lakes breeding population of piping plovers are those habitat components that are essential for the biological needs of foraging, sheltering, reproduction, rearing of young, intra-specific communication, roosting, nesting, and dispersal. The primary constituent elements are: (1) total shoreline length of at least 0.2 km (656 ft) of gently sloping, sparsely vegetated sand beach with a total beach area of at least 2 ha (5 ac) and a low level of disturbance from human activities; (2) 50 to 100 m (164 – 328 ft) of beach at least 7 m (23 ft) wide; (3) protective cover for nest and chicks; and (3) distance to treeline at least 50 m (164 ft). Beach width may be narrower provided at least 7 m of appropriate sand and cobble areas exists between the dune and the treeline.

Life history of the Great Lakes piping plover

In the Great Lakes region, piping plovers forage, nest, and rear young on sandy beaches with sparse vegetation and the presence of small stones (greater than 1 cm) called cobble. Their nests consist of shallow depressions (approximately 6 cm in diameter and 2 cm deep) in the sand. Males establish territories in April and nesting begins in mid to late May. Clutch size is typically 3 or 4 eggs. Both sexes participate in incubation, which lasts 25 to 31 days and occurs from late May to late July. Although piping plovers in the Atlantic Coast and Great Plains may renest up to four times, the Great Lakes birds usually will re-nest only once per breeding season. Renesting may occur in the event a nest fails or is destroyed. Chicks are precocial and are able to feed themselves within a few hours of hatching. However, for another 21-30 days (until they are able to fly) adults continue to tend their broods by leading chicks to and from feeding areas, sheltering them from harsh weather, and protecting the young from predators.

In studies to date, chicks spent the majority of time feeding (up to 89%) while resting and maintenance activities made up the remaining time (U. S. Fish and Wildlife Service 1996). Cairns (1977) found that chicks typically tripled their weight during the first two weeks after hatching; chicks that failed to achieve at least 60% of this weight gain by day 12 were unlikely to survive. Piping plovers feed primarily on exposed beach substrates by pecking for invertebrates one centimeter or less below the surface. Although the data are scant, their diet is generally believed to consist of insects, marine worms, crustaceans and mollusks. Most foraging is diurnal.

Feeding territories are generally contiguous to nesting territories, although instances where adult foraging areas are widely separated from nesting territories are not uncommon (U.S. Fish and Wildlife Service 1996). Studies of adult and chick movement on the Atlantic Coast suggest that home range is highly variable, with movements up to 1000 meters (3280 ft) from the nest site documented. Observations at Great Lakes sites indicate that juvenile plovers will use 1 to 4

miles (1.6 – 6.4 km) of shoreline for feeding. After fledging, adults and young may congregate on neutral (non-territorial) feeding grounds until they migrate south (U.S. Fish and Wildlife Service 1996).

The majority of adults depart in August, though some may leave as early as mid-July. Juveniles typically disperse a few weeks later than the adults, but most depart by late August. Unlike the breeding ranges, the wintering piping plover populations overlap and extend along the Atlantic and Gulf coasts from southern North Carolina to Mexico and into the West Indies and Bahamas.

Breeding habitat (nesting, foraging and rearing areas) consists of open, sparsely vegetated sand-pebble areas. In the Great Lakes region, nest sites occur on sand spits or sand beaches associated with wide, unforested systems of dunes and inter-dune wetlands. Physical characteristics include a minimum of 0.2 km (656 m) of gently sloping, sparsely vegetated (< 50% herbaceous and woody cover) sand beach with a total beach area of at least 2 ha (5 ac) and a low level of disturbance from human activities and domestic animals. Additionally, these appropriately sized sites must have areas of at least 50-100 meters in length where (1) the beach width is more than 7 m, (2) there is protective cover (e.g., small patches of herbaceous vegetation, cobble, gravel or debris such as driftwood, wrack, root masses, or dead shrubs) for nests and chicks, and (3) the distance to the treeline is greater than 50 m.

Population dynamics of Great Lakes piping plover

The Great Lakes population is localized in 3 interbreeding areas: upper peninsula, northwest lower Michigan, and the Sleeping Bear Dunes area (Cuthbert, *in litt.* 1999 March 2). Since Federal listing, the Great Lakes population has ranged from 12 to 32 breeding pairs (Table 1) and reproductive success has fluctuated among years.

In a recent population viability analysis (Plissner and Haig 2000) that combined the Great Lakes and Great Plains populations, a baseline model indicated that the mean reproductive success must increase 36 percent (i.e., an increase from 1.25 to 1.70 fledglings per pair) to achieve a 95 percent probability of this metapopulation persisting for 100 years. To maintain a stable trend in this metapopulation, fecundity must reach 2 fledglings per pair. The model also indicated, however, that even at this reproductive rate the persistence of the Great Lakes population is unlikely. Similarly, Wemmer and colleagues found that, upon the completion of a habitat-based population model, the Great Lakes piping plover population is unlikely to persist for more than 25 years given the current reproductive success, nest site use patterns, and nesting densities. The model suggests that for the Great Lakes population to reach a viable population size, piping plovers must nest at densities more than double the maximum recorded at each of the breeding areas occupied since 1984 or colonize new or long-unoccupied breeding areas. These modeling efforts underscore the precarious status of piping plover in the Great Lakes and clearly indicate that greatly improved reproductive success and protection and creation of additional breeding habitat are needed for the long-term persistence of the Great Lakes population.

Status & distribution of the Great Lakes piping plover

Piping plovers were considered locally common throughout the Great Lakes region (Hatt et al. 1948, Cotrille 1957 *in* Stucker, Wemmer & Cuthbert 1998); the population was estimated to have been between 492 and 682 breeding pairs in the late 1800s. The Great Lakes population

historically nested on beaches in Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin, and Ontario, Canada. By the 1980s, piping plovers were extirpated from all States except for Michigan and Wisconsin (though they were nearly so in Wisconsin, as well). The most prominent factor in the decline of piping plovers appears to be human disturbance. In the early 1900s, hunting led to the initial decline--nearly extirpating the Atlantic Coast birds. Protective legislation helped them to recover by 1925, and populations reached a 20th Century high in the 1930s (Service 1994). These numbers soon plummeted as recreational and commercial use of beaches increased. Piping plover numbers continued to decline in the 1940s and 1950s as shoreline development expanded, resulting in the loss of their breeding habitat. By 1979, the Great Lakes population had decreased to 38 pairs, and to only 17 pairs at the time of listing in 1986 (Stucker and Cuthbert 1999). Plover nesting occurred at only a few sites along the northeastern shore of Lake Michigan and southeastern shore of Lake Superior in Michigan. Although still extant in Michigan, plover numbers declined here as well. Historically, the Michigan piping plover distribution included 24 counties, 18 of which included documented nesting. Of these 18 counties, only 13 have recently supported nesting plovers.

Since that time, the number of pairs has ranged from 12 to 32 (Stucker and Cuthbert 1999), and the population has gradually expanded south and west within the Great Lakes watershed. This population increase is being aided by intense State, tribal, Federal and private conservation actions directed at the protection of the piping plover. Activities such as habitat surveys, beach restoration, public education, habitat protection and enhancement, and the protection of nests from predators and disturbance through the use of predator exclosures and psychological fencing have been successful in improving the status of the plover in the Great Lakes. The current distribution of piping plovers within the Great Lakes is concentrated in Michigan and consist of 3 local populations: upper peninsula, northwest lower Michigan and Sleeping Bear Dunes area. Of the 11 current nesting sites in Michigan, 5 are in the Upper Peninsula and 3 in each of the other two areas (note, plovers nested at one site in northern Wisconsin in 1998 and 1999).

In recent years, the SBD population's contribution to the overall Great Lakes population has been increasing (Table 1). Since 1996, SBD birds represented 27 to 30% of all Great Lakes piping plover pairs. Similarly, from 1996 through 2000, the Sleeping Bear Dunes population produced 7 to 9 nests (which represented 24 to 38% of Great Lakes nests) and 4 to 16 fledglings (representing 13 to 33% of the Great Lakes fledglings) annually.

Threats to the Great Lakes piping plover

Human disturbance continues to be a serious threat to the survival and recovery of the Great Lakes piping plover population. Development and use of shoreline may permanently convert beach habitat to another land use type or alter the physical nature of the beach. Motorized vehicles crush eggs, and kill adults and chicks. Off-road vehicles (ORVs) may degrade the quality of the substrate for nesting and foraging and deter piping plover nesting or lead to nest abandonment. Beach walking, kite-flying, fireworks, and bonfires are a few of the many human activities that disturb and disrupt normal piping plover behavioral patterns. Pedestrians on beaches may crush eggs or displace unfledged chicks forcing them out of preferred habitats, decreasing available foraging time, and causing expenditure of energy. High pedestrian use has deterred nesting. Even seemingly innocuous activities such as kite-flying (it is believed that plovers perceive kites as potential avian predators) may deter plover use. Increased disturbance

Table 1: Great Lakes Piping Plover Productivity: 1983-2000

Great Lakes Population				**Sleeping Bear Population**				**Cathead Bay**			
Year	#Pairs	#Nests	Fecundity	Year	#Pairs	#Nests	Fecundity	Year	#Pairs	#Nests	Fecundity
1983	18	20	39	1983	2	1	0	1983	2	1	0
1984	13	14	13	1984	3	3	1	1984	2	2	0
1985	19	26	15	1985	2	2	0	1985	0	0	0
1986	17	19	10	1986	3	2	0	1986	1	0	0
1987	16	21	14	1987	1	1	0	1987	0	0	0
1988	14	17	29	1988	0	0	0	1988	0	0	0
1989	15	13	24	1989	0	0	0	1989	0	0	0
1990	12	12	21	1990	0	0	0	1990	0	0	0
1991	17	18	34	1991	0	0	0	1991	0	0	0
1992	16	17	16	1992	1	0	0	1992	0	0	0
1993	18	19	15	1993	3	2	2	1993	1	0	0
1994	19	21	28	1994	4	5	5	1994	0	0	0
1995	21	23	42	1995	4	4	5	1995	0	0	0
1996	23	23	30	1996	7	7	4	1996	2	2	0
1997	23	25	43	1997	7	9	10	1997	2	2	0
1998	24	24	48	1998	9	9	16	1998	3	4	7
1999	32	38	49	1999	9	9	15	1999	2	2	0
2000	30	34	40	2000	8	8	10	2000	0	0	0
Total	347	384	510	Total	63	62	68	Total	15	13	7

Table compiled from Wemmer et al. (1995 & 1997), Stucker et al. (1998), Stucker and Cuthbert (1999), MNFI 1999a, Stucker et al. (2001) and Stucker (Jennifer Stucker, Research Assistant, University of Minnesota, *in litt*. 2000 October 12).

by pets also accompanies human presence. Dogs chase, capture and kill adults and chicks. Repeated flushing from nests by pedestrians or dogs exposes eggs to potentially lethal temperatures. Disturbance can also result in chicks being separated from adults, which makes them more vulnerable to predators. Disturbance results in less time foraging, which is especially detrimental for chicks during the first few weeks.

Human use of beaches, also attracts and potentially augments populations of scavengers, thereby exacerbating natural predation. Predators of plover eggs and chicks include red fox, skunk, raccoon, Norway rat, opossum, crows, gulls, and common grackles. Such predators have severely hindered nesting success at several Great Lakes locations.

STATUS OF PITCHER'S THISTLE

Unless noted otherwise, all information is cited from the Technical/Agency Draft Recovery Plan (1991) and from Pavlovic et al. (in litt. 2000) and references within. This section is a discussion of the Pitcher's thistle. It includes information on the species' life history, its habitat and distribution, and past human and natural factors that have led to the current status of the species.

Species description for Pitcher's thistle

Pitcher's thistle was first described by Eaton in 1829 from the type specimen, which was apparently collected on or near Mackinac Island by Dr. Edwin James (Voss 1996). Pitcher's thistle is a monocarpic (flowers and sets seed only once) perennial. Individuals typically have a single branching flowering stem with cream or pinkish color flowers. Juveniles and adults have a tap root that may reach 2 m (6.6 ft) in length.

Pitcher's thistle populations occur in six geographic groups: southern Lower Michigan peninsula, northern Lower Michigan peninsula, Straits of Mackinac, Upper Peninsula of Michigan, Indiana, and Wisconsin.

Pitcher's thistle was federally listed as threatened in July 1988 (53 *FR* 27137). It is classified as threatened in Indiana, Michigan, and Illinois (where it is extirpated), and endangered in Wisconsin. It is listed as threatened in Canada. The final recovery plan is in its final stages of development. According to the technical/agency draft recovery plan, Pitcher's thistle will be considered recovered when: (1) 80 of the most viable occurrences representing each biogeographic region and dune type, including all federal and state owned occurrences, and all occurrences ranked BC or higher regardless of ownership, are protected and managed; (2) landowner contacts have been initiated for the remaining occurrences; (3) the species is restored to a minimum of three protected sites in geographic areas where it no longer occurs; and (4) restored metapopulations are ecologically functional for 20 years.

Life history of Pitcher's thistle

Pitcher's thistle colonizes patches of open, windblown areas of the landscape, and gradually declines locally as the density of vegetation and ground litter increase through plant succession. It is patchily distributed with varying population sizes in all open zones of the dune. *Cirsium pitcheri* density peaks, however, in mid-successional habitats and requires 70 percent open sand for successful seedling establishment and survival.

Seed dispersal commences in late July at the northern limits of its range, but can occur from June to August. Seed dispersal is primarily by seeds blowing from the inflorescence head or by whole plant and heads falling to the ground at the end of the flowering season. Based on seedling distributions relative to last year's plants, the maximum dispersal distance ranges from 1.83 to 4.00 m.

Seed dormancy is broken by cold, moist stratification, and germination occurs in May and June, but may vary yearly depending on rainfall. Seedlings produce 1 to 6 leaves in the first season. Seedling densities are greater where bare ground is abundant than in sites with more vegetation cover.

Age of reproduction ranges from 5 to 8 years and appears to be correlated with habitat, with earlier blooming in more stabilized habitats. The specific triggers of blooming are unknown, although an interaction between growth rate and age is a likely factor. Adults are typically single stemmed, but multiple stemmed plants (2 to 30 stems) are known. The number of flowering heads per plant is highly correlated with stem diameter, but varies with habitat, latitude, plant size, and year. Pitcher's thistle blooms from May to September, with the date of peak anthesis occurring later with increasing latitude (mid-July at Sleeping Bear Dunes).

Cirsium pitcheri is found most frequently in the near-shore plant communities, although it occurs in all non-forested areas of the Great Lakes dune systems. Based on the colonization and dispersal opportunities for *Cirsium pitcheri,* the Great Lakes dune communities can be categorized into four landscape types. The three lake level dune types are simple linear beach foredunes and continuous and discontinuous dune complexes. The fourth type is continuous perched dune complex, which is usually found on glacial moraines at high elevations above the lake. Pitcher' s thistle lives on the foredunes of this dune system, and little or no *Cirsium* habitat occurs inland in simple linear dune systems. Because the foredune may be flooded, simple linear dunes do not have refugia during high lake levels. Consequently, Pitcher's thistle occurrences may be eliminated by natural or human disturbances concentrated on the beach and first dune. Such disturbances include erosion by high lake levels, alteration of sand movement by erosion control structures (groins and jetties), or repeated trampling of plants by beachcombers. Continuous dune complexes occur on the east and west shores of Lake Michigan, and have continuous expanses of *Cirsium pitcheri* habitat for colonization. Pitcher's thistle locally extirpated from one portion of a continuous dune complex can be recolonized by seed from Pitcher's thistle on adjacent dunes. Chances for *Cirsium pitcheri* persistence in these systems are high provided the dune complexes remain large, unfragmented, and processes of dune accretion and erosion, plant succession, and habitat turnover continue.

On discontinuous dune complexes, the shoreline runs roughly perpendicular to prevailing northwest winter winds, and linear dunes are interrupted by blowouts that extend inland into forested dunes. The blowouts serve as habitat refugia for Pitcher's thistle. On discontinuous dune complexes, Pitcher's thistle are more buffered against extirpation than simple linear dunes. This is because blowouts extend suitable open habitat for Pitcher's thistle inland, away from potential flooding. As blowouts on discontinuous dune complexes are typically separated by

several kilometers of unsuitable forested habitat, extirpated foredune and blowout areas are unlikely to be recolonized as quickly as those on continuous dune complexes.

Continuous perched dune complexes are primarily found on the northwest section of the northern Lower Michigan and in one spot on the Lake Superior shoreline of the Michigan's Upper Peninsula. Continuous perched dune complexes are elevated on ancient glacial moraines with bluffs 30 to 120 m (98 – 393 ft) above the present lake level and can extend at least a mile (1.6 km) inland. Perched dunes are nourished by sand blowing off nearby bluff faces when lake levels are high rather than from beaches when lake levels are low. Due to their exposure to frequent high winds, perched dunes have highly dynamic foredunes at the bluff edges.

Pitcher's thistle is most likely to persist on the three extensive dune landscape types: continuous dune complexes, discontinuous dune complexes, and perched dune complexes. These three types of dune systems formed hundreds of years ago after deglaciation produced abundant sand supplies. Because sediment accretion rates are lower now, these dune complexes cannot be recreated if they are destroyed, but they can be reinvigorated if sand supply periodically increases. Simple dune systems, however, are maintained by ongoing processes and can persist provided there is sufficient, uninterrupted (by construction or stabilization) sand delivery. Given the differing dynamics, dune type is an important factor in assessing Pitcher's thistle viability.

Population dynamics of Pitcher's thistle

As a species, Pitcher's thistle exhibits characteristics of metapopulations. Specifically, Pitcher's thistle is patchily distributed across a dynamic dune landscape and is dependent on local extinctions and recolonizations for persistence.

For a particular occurrence of Pitchers thistle to survive, disturbance must be frequent enough to prevent extirpation from succession and infrequent enough to allow juveniles to reach maturity; thus, the Pitcher's thistle life history is finely tuned to a specific disturbance regime. Disturbances may eliminate local occurrences, but as long as those disturbances are not synchronous throughout the landscape, and occurrence creation exceeds decline, the species will persist. From a landscape perspective, recovery of Pitcher's thistle will require retaining the dynamic dune processes that create and maintain habitat and the preservation large unfragmented dune systems, with many local patches widely dispersed among multiple successional stages throughout the dune system.

Status & distribution of Pitcher's thistle

Pitcher's thistle is endemic to the beaches and grassland dunes of lakes Michigan, Superior, and Huron, with the majority of known sites occurring along the shores of Lake Michigan. Pitcher's thistle's historical distribution includes approximately 180 occurrences along the shores of Michigan, Illinois, Indiana, Wisconsin, and Ontario. Michigan historically and continues to support the majority of known locations (90%). The bulk of Michigan sites (74%) occur in the northern Lower Peninsula, many (70) of which occur in just 4 counties (Emmet, Leelanau, Mackinac and Charlevoix counties). Twenty-six of the Michigan sites are considered good to excellent quality occurrences, and another 42 fair to good. There are 8 extant occurrences in Wisconsin, and 6 of these are considered good to excellent sites. Pitcher's thistle occurs at 8 sites in Indiana and is considered extirpated from Illinois.

Threats to Pitcher's thistle

Development, sand mining, beach and dune stabilization projects, and certain types of frequent recreation have destroyed, modified or curtailed Pitcher's thistle habitat. Direct loss of Pitcher's thistles and their habitat has occurred as a result of residential, condominium, resort, and marina development. In addition to direct habitat loss, such developments have lead to fragmentation of Pitcher's thistle populations. Approximately 400 permits are issued annually for home development in "critical dune areas." Many of these areas support Pitcher's thistle or potential habitat.

Construction of coastal roads removes and fragments sand dune habitat, alters local sand dune processes, provides access for destructive recreational activities, and spurs shoreline development. Although human disturbance along highway shoulders adjacent to existing thistle populations can often encourage the short-term establishment of Pitcher's thistle, these occurrences are vulnerable to destruction from road maintenance and improvements activities.

Beach recreation--frequent and prolonged pedestrian and off-road-vehicle use--threaten Pitcher's thistle and their habitat. Trampling from high pedestrian use causes a decrease in survivorship and reproduction. Trampling and high visitor use is a significant threat at certain areas in Wisconsin, Indiana, and Michigan. Off-road-vehicles (ORV) destroy plants, create new blowouts and severely destabilize dunes. Damage from ORV is common on dunes that have easy access, such as along a State road or in municipal parks.

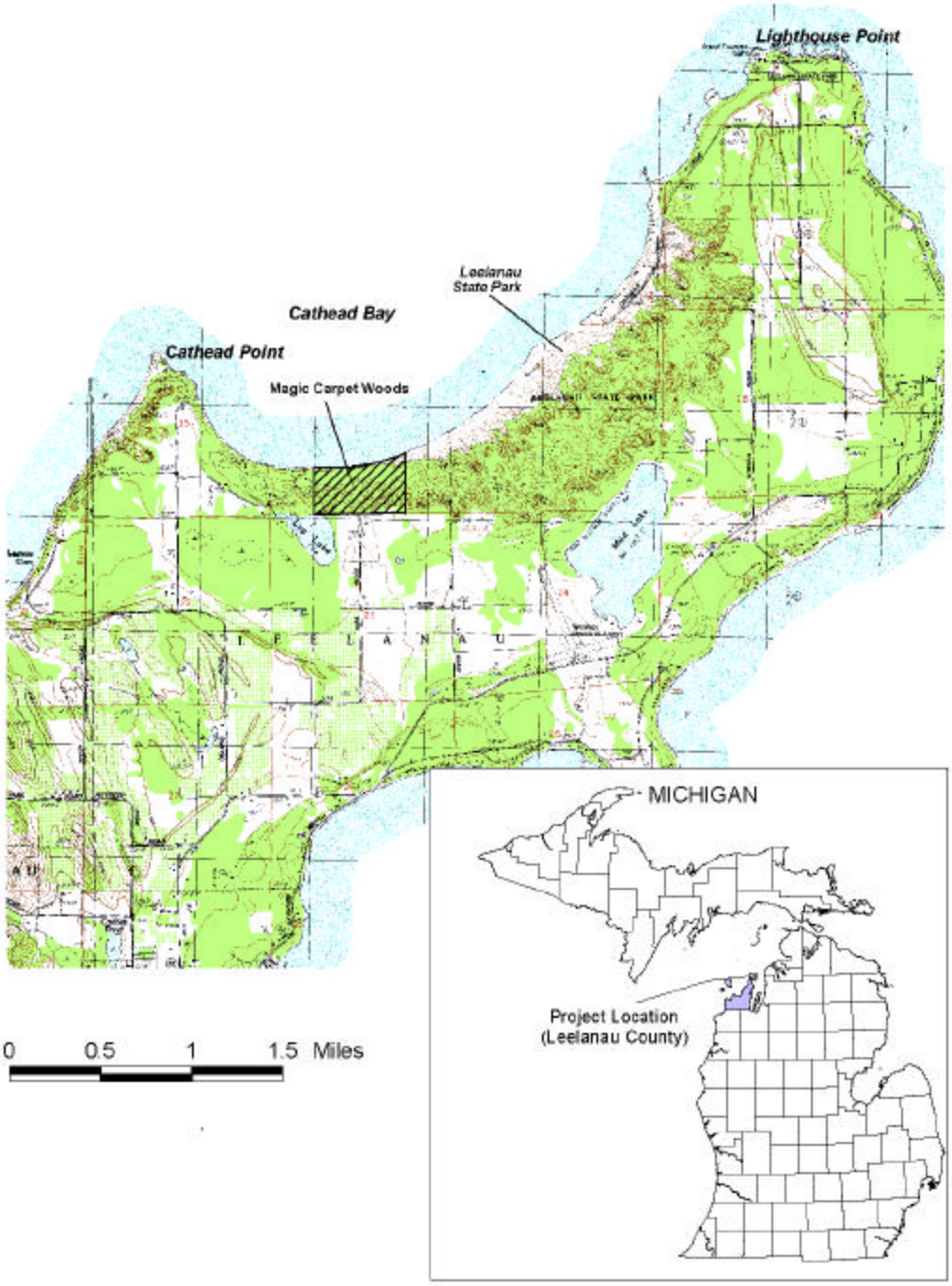
Shoreline stabilization projects such as jetties, sea walls and rip-rap alter local geomorphic processes, which create and maintain Pitcher's thistle habitat. Sea walls and jetties have been built along beaches containing *Cirsium pitcheri* in Wisconsin, Indiana and Michigan. Vegetation plantings stabilize and alter dune building processes.

ENVIRONMENTAL BASELINE

*This section is an analysis of the past effects of State, tribal, local and private actions already affecting the species within the **action area** and the present effects within the **action area** that will occur contemporaneously with the consultation in progress. It includes a description of the status of the species and its critical habitat within the **action area**.*

As explained under Project Description, the action area for this consultation includes the entire shoreline of Cathead Bay. Cathead Bay is the area of beach between Lighthouse Point on the northwestern tip of Leelanau Peninsula and Cathead Point to the south (Figure 1). Approximately one-quarter of the shoreline is in public ownership. Leelanau State Park occurs in two distinct parcels along Cathead Bay. The smaller northern parcel is at the tip of Leelanau Peninsula on Lighthouse Point. This part of the Park is separated from the State Park proper (1.2 miles of shoreline) by private property. A densely developed residential area in open dune abuts the Park's (proper) northern boundary. The Property adjoins the Park at its southwestern boundary. The Property stretches along the shoreline for approximately a half mile. Additional private housing occurs less densely in forested land to the south and west of the Property. At present, the only undeveloped land on the approximately 3.7 mile (5.6 km) Cathead Bay shoreline is the Property and the State Park.

Figure 1. Cathead Bay, Leelanau County, Michigan.



Status of piping plover within the action area

The Cathead Bay piping plovers are part of the larger Sleeping Bear Dunes population. From 1983 to 2000, the number of pairs on Cathead Bay has ranged from 0 to 3 and the number of nests 0 to 4 (Table 1). Nesting has occurred on Cathead Bay from 1996 through 1999, with 2 to 4 nests each year. No nesting occurred there in 2000. From 1996 to 1999, Cathead Bay represented 23% of pairs, 24% of nests and 15% of fledglings of the SBD population. In 1998, successful reproduction was documented for the first time on Cathead Bay, with 7 chicks fledged. This represented 15% of the 1998 chicks in the Great Lakes. In 1996, 1997, and 1999, no chicks fledged. Researchers believe that predation of hatchlings is hindering success on Cathead Bay (Cuthbert *in litt*. 2000 February 7). Despite poor success since 1996 and the lack of nesting in 2000, the resumption of nesting in 1996 and the success in 1998 indicate the high potential for Cathead Bay to contribute to piping plover recovery.

All nesting to date has occurred on Leelanau State Park, with the closest known nest approximately 0.5 to 0.75 mile (0.8 – 1.2 km) from the Property boundary. Several patches of suitable nesting habitat exist between the Property and the nearest known nest, so nesting may occur even closer (Cuthbert, *in litt*. 1999 March 2). Piping plovers have been observed foraging along the shoreline just east and northwest of the Property. To date, no plovers have been observed on the Property (Cuthbert *in litt*. 1999 March 2).

The entire Cathead Bay shoreline provides suitable foraging habitat, but only a portion of it is currently used or considered suitable for nesting. Under current conditions, prime nesting habitat occurs only on the State Park land. Physical and biological changes to Cathead Bay (e.g., lower water levels and increased plover numbers), however, could extend nesting habitat along the Property's shoreline (specifically, lots 1 and 2), and along the shoreline north of the State Park. Based on available shoreline, researchers estimate that Cathead Bay could potentially support up to 7 pairs of plovers (Cuthbert, *in litt*., 2000 December 12). As such, Cathead Bay will continue to provide important habitat for the Great Lakes piping plovers.

The Property has two distinct ecological communities; forest and open beach/dune. The open beach/dune consists of a relatively narrow band of open unvegetated, mostly sandy wave washed beach, which progresses landward to a parallel band of open, grassy, low dunes. Forest covers the majority of the Property (88 of 91 acres). Along the lakeshore, open beach/dune occupies a band between the forest and water. The unvegetated beach widens noticeably in the eastern third of the Property and a small blow-out occurs in the easternmost side of the Property (lots 1 - 3). The open dune, which lies between the open, unvegetated beach and the forest, is relatively narrow and is periodically inundated in the western two-thirds of the Property[1]. Although the

[1] Measurements made during October 2000, indicate that at the Property's western border the distance between the observed high water (OHW) line and the forest edge is 10 feet. The OHW is approximately at the crest of the foredune where the open beach begins, so these measurements include the open dune, but not the beach. Progressing east towards the State Park, this distance gradually increases. At lot 7, it was 33 ft, at lot 4, 76 ft and at lot 3, 125 ft. About 1/4 of the way east into lot 2, the distance reaches 165 ft, then reaches a maximum of 324 ft and diminishes to 245 feet in lot 1, then expands to 320 ft at the Park boundary. A small narrow cobble pan behind the foredune in lots 1 and 2 parallels the beach. The beach is similarly narrow on the west and gradually widens toward the Park. Service biologists (M. DeCapita, pers. comm.) measured beach on July 21, 2000 at 45 ft (13.7 m) at lot 8 and 57 ft at lot 1. The beach had widened substantially since 1998 when the Lake Michigan level began a 2 - 3 ft decline. The 1999 high water mark, or waters edge, was visible on July 21, 2000 as a low, narrow ridge, so the 1999 beach width

beach and dunes widen in the eastern third of the Property, the limited beach area, dense vegetation cover, and low cobble density diminish the suitability of this area for nesting. However, the general configuration and location in relation to water and tree lines indicate that lots 1-3 may provide possible nesting habitat, especially if nest sites become limiting (Cuthbert *in litt*. 1999 March 2). The shoreline along the Property provides suitable foraging habitat. As plovers have been observed east and northwest of the Property, it is likely that plovers have foraged on the Property's shoreline, and given the Property's close proximity to known nesting sites, will continue to use the Property in the future.

The Leelanau State Park operates a piping plover protection program each year. This includes employment of a temporary steward to search for nests and, if nesting occurs, monitor and protect nests. Nests are protected with area closures, signs and predator exclosures as done at all other Great Lakes nests on state or federal public land. Similar protection occurs on private or township land where permission is granted. The Park steward also interacts with Park visitors to provide information and assist in avoiding disturbance of nests and plovers.

The Service has solicited interest of private parties to participate in conserving piping plover on Cathead Bay. To date, 4 piping plover protection plans have been signed; 2 south of Cathead Point and 2 north of the State Park. These plans indicate a high level of concern and interest by the owner, and facilitate efforts to provide protection from predators and limit human disturbance. Researchers in the Great Lakes have found that consistent use of such measures has improved hatching success (Jennifer Stucker pers. comm. 2000).

The shoreline along Cathead Bay is proposed critical habitat (Critical Habitat Unit MI-12, 65 *FR* 41819). This unit encompasses approximately 5.9 km (3.7mi) of Lake Michigan shoreline. It includes areas currently occupied (e.g., Leelanau State Park) and areas that provide potential piping plover nesting habitat. Approximately 1.9 km (1.2 mi) are part of the State Park and the remaining 4.0 km are privately owned land. The proposed unit extends from the intersection of the Lake Michigan shoreline and the line between section 12 township 32N range 11W and section 7 township 32N range 10W to the intersection of the shoreline with the southern boundary of section 16 township 32N range 11W north of Christmas Cove.

Within this broad area, only those specific locations that currently or potentially could provide the primary constituent elements are proposed critical habitat. The only area currently supporting nesting birds occurs on Leelanau State Park. However, as indicated in the Status section, the current population density in the Great Lakes is unlikely to support a long-term viable population. To achieve long-term viability, an increase in the extent of nesting habitat is needed. Thus, in designating those areas essential to the conservation of the Great Lakes piping plover, all currently occupied, as well as, potentially suitable nesting habitat should be considered critical habitat. According to the proposed critical habitat rule, areas unoccupied by nesting birds may be designated critical habitat if such areas provide, or have the capacity to develop, some or all of the primary constituent elements. The shoreline of the Property supports marginal nesting habitat, and may have the capacity to become more suitable. Lots 1 through 3

---

could be measured at about 28 ft at lot 8 about 70 – 80 feet (21 – 24 m) wide (except where the dunes widen near the park boundary) of open unvegetated, mostly sandy wave washed beach, which progresses landward to a parallel band of open, grassy, low dunes.

may provide marginal nesting habitat in terms of beach width and distance to tree line, but do not appear to meet cobble density or areal minimums for primary constituent elements. The remaining shoreline is currently too densely vegetated, and beach width and cobble density are too limited to be considered suitable nesting habitat. However, the suitability of lots 1 through 3 could improve and the remaining shoreline could become suitable if several physical and biological changes occur. Specifically, a decline in water levels would provide for greater beach width, which would increase the area of dune with sparse vegetation and greater cobble density. Water levels of Lake Michigan have historically fluctuated greatly. Figure 2 shows the water levels since 1923. Although water levels would need to be slightly lower than any previously recorded, the magnitude of past water fluctuations indicates that this is plausible. With this change, the Property would sufficiently provide all the primary constituent elements necessary to be suitable for nesting. For these reasons, the shoreline on the Property is considered proposed critical habitat.

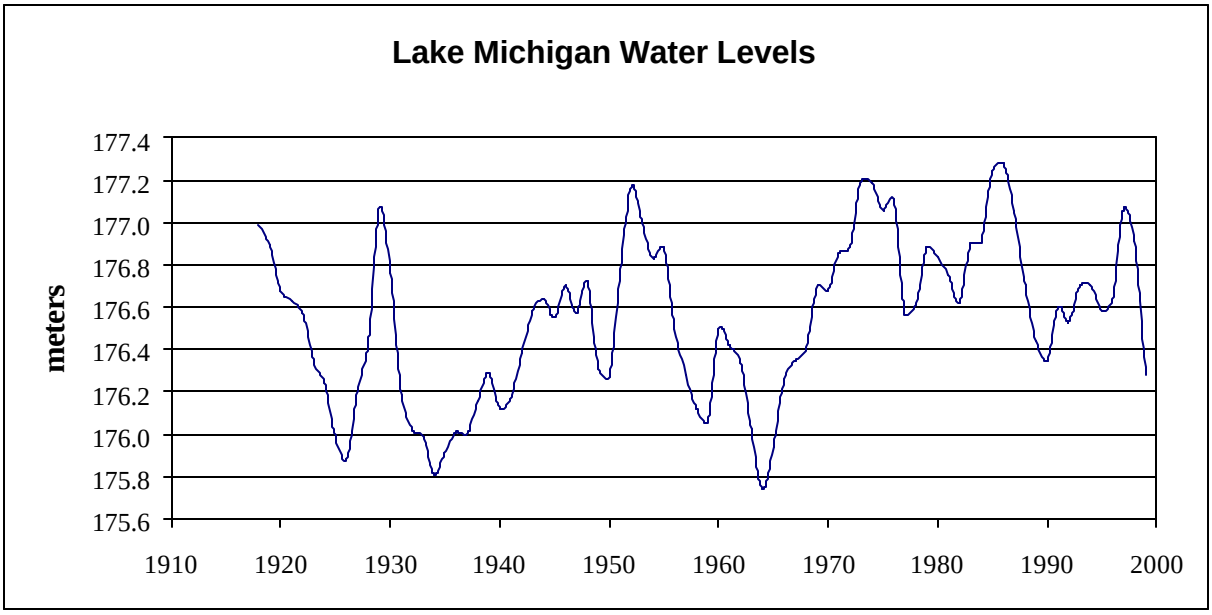
Factors affecting piping plover's environment within the action area: *This analysis describes factors affecting the environment of the species or critical habitat within the **action area**. It includes Federal, State, tribal, local, and private actions already affecting the species or that will occur contemporaneously with the consultation in progress.*

Intensified development, human disturbance and high levels of predation are the primary threats on Cathead Bay. Nesting plovers are highly susceptible to disturbance by people and pets on the beach. Human disturbance disrupts adult birds' care of their nests and young and may inhibit incubation of eggs. Further, adults may leave the nest to lure away an intruder, leaving the eggs or chicks vulnerable to predators and exposed to weather. Disturbance may also lead to nest abandonment. Based on several studies, the distance at which plovers will move upon being disturbed varies. Although the average movement was usually <100 m (328 ft), birds have been observed moving up to 300 m (984 ft) from the nest when disturbed (U.S. Fish and Wildlife Service 1988). Generally, those sites receiving stronger protection (i.e., less human disturbance) have had consistently higher reproductive success (Stucker and Cuthbert 1999).

As explained above, a piping plover protection program is being implemented at the State Park. As a result, human disturbance has been adequately controlled, but predation continues to be problematic. Although land north/east of the Park has the physical characteristics of suitable nesting habitat, plovers are not using the area. This area is densely populated with high levels of human disturbance, which may be preventing piping plover nesting or could be affecting foraging.

Although undeveloped, the Property is also subjected to considerable human use. Most of the current use is trespass. Most people access the beach via the trail across the Property from Kehl Road. Others approach on foot along the beach from the adjacent State Park or in lesser numbers from private property to the west. Human and dog footprints are regularly found on the beach. It is also a popular area for boaters to anchor offshore and access the beach. Unauthorized use by campers is regularly observed on the Property. This level of use has been observed throughout the 30-year period of current ownership.

Figure 2. Water levels for Lake Michigan (http://huron.lre.usace.army.mil/levels/hlevmh.html)



Activities that may destroy or adversely modify critical habitat include those that alter the primary constituent elements to the extent that the value of the critical habitat for the survival and recovery is appreciably diminished. In areas currently unsuitable for nesting, activities that would be considered adversely modifying critical habitat are those which would alter the ability of an area to develop the primary constituent elements. This include activities that could alter the physical characteristics of a site or cause nest abandonment from intense human disturbance. Activities that could adversely modify critical habitat include ORV and other vehicular activity on beaches, the construction of facilities that increase ORV use, unrestrained pets, high human use densities, and beach stabilization activities that impede natural overwash processes (e.g., beach nourishment, planting of vegetation, and construction and maintenance of seawalls, breakwaters and other off-shore stabilizing devices). Unrestrained pets, human disturbance and ORV activity are possibly affecting piping plover habitat on Cathead Bay.

Status of the Pitcher's thistle within the action area

Cathead Bay is considered one of the five highest quality occurrences of Pitcher's thistle rangewide. According to the Michigan Natural Features Inventory, Cathead is ranked as a "good-to-excellent" occurrence. This is one of 43 sites (26% of all U.S. sites) ranked good or better. Pitcher's thistle is documented from just south of Lighthouse Point to the Property (MNFI 1999b). Habitat is relatively continuous, and thus, Cathead Bay is considered a single occurrence (i.e., a local population). Pitcher's thistle are commonly scattered and sometimes dominant throughout Cathead Bay. All age classes are present, which indicates that this population is viable. The Property was surveyed in 1998, with 427 individuals located. The entire Property shoreline supports the species, although the majority of plants were found in lots 1 through 3.

Factors affecting Pitcher's thistle environment within the action area: *This analysis describes factors affecting the environment of the species or critical habitat within the **action area**. It includes Federal, State, tribal, local, and private actions already affecting the species or that will occur contemporaneously with the consultation in progress.*

There are both natural and human related actions affecting Pitcher's thistle plants on Cathead Bay. Pitcher's thistle seeds are subject to herbivory. Artichoke plume moth larvae (*Platyptilia carduidactyla*), ground squirrels, and goldfinches (*Spinus tristis*), sparrows and other ground feeding birds, deer, and small mammals prey on Pitcher's thistle seeds. It does not appear, however, that current levels of herbivory are limiting the thistle's viability. Human related threats include trampling, ORV use, habitat fragmentation, and loss/disruption of dune processes.

EFFECTS OF THE ACTION

*This section includes an analysis of the effects of the **proposed action** on the species and its critical habitat and its interrelated and interdependent activities. It also includes indirect effects, which are caused by or result from the proposed action, later in time, and, reasonably certain to occur.*

Effects of the action on piping plover

As explained in the Environmental Baseline section, the physical attributes of the shoreline make the beach area on the Property suitable foraging habitat. Further, the blowout area (Lots 1 and 2)

may, although not prime, provide suitable nesting habitat. This half-mile stretch of shoreline represents a consequential quantity of piping plover habitat, as it directly connects to a 2-mile (3.2 km) stretch of nesting habitat. Although plovers have not been observed on the Property to date, we believe that the adjacent nesting birds (which have recently consisted of 3 families, or a total of about 18 plovers) would inevitably forage, may even need to at some point in the chicks' development, on the Property. Given its suitability and proximity to the Park, we believe the Property provides an important habitat component for the Cathead Bay piping plovers. Thus, the effects analysis below is premised on the Service's belief that plovers currently use the Property for foraging and may use it for nesting in the future as well.

All proposed home and deck construction will occur entirely within the forested portion of the Property and will not be located within 80 feet (24.4 m) and 65 feet (19.8 m), respectively, of the lake's ordinary high water mark. Similarly, walkway structures will not be constructed in plover habitat. These structures will be constructed from the forest edge to the crest of the foredune and at ground level without handrails, which could function as perches for predatory birds. Thus, there will be no physical habitat destruction or modification of plover habitat as a result of the proposed action. Human and pet disturbance could potentially affect proposed critical habitat on the Property. However, as explained below, the conservation measures proposed by the applicant should minimize these impact such that disturbance does not exceed a low level (i.e., does not impede successful nesting and does not reduce survival and recovery of the population).

The most obvious and serious potential consequent of the proposed project is disturbance of plover activities from human presence on the beach. Although the future level of beach use as a result of the proposed project is unknown, it is almost certain that it will be more consistent. Beach activities such as walking/running, flying kites, fireworks, among others may have profound effects on plovers using the area. Pedestrian traffic may disrupt foraging behavior of both adults and chicks. Such disturbance may cause piping plover to interrupt their feeding activities and increase their energy expenditure. This is particularly harmful during the two weeks following hatching, when efficient foraging is critical to chick survival. Plover chicks typically triple their weight during their first two weeks of life. They need to achieve at least 60 percent of this weight gain to survive. Also, throughout the summer, consistent disturbance can significantly reduce their ability to store proper fat reserves for the winter migration. Pets, particularly unrestrained dogs, can be especially injurious to foraging plovers. In addition to disrupting foraging behavior, pets will prey upon chicks. Even if pets do not directly kill, chasing can cause plovers to flush in different directions. Chicks separated from their parents and not immediately reunited are more at risk of starvation or predation. High levels of human beach use could deter plovers from using the Property altogether. As explained in the Environmental Background section, these threats are occurring; however, the frequency and intensity of these disturbances will likely increase with residential occupation of the Property unless human behavior is modified.

Human use may lead to increase in predator and scavenger abundance or local changes in their distribution. Scavengers, such as gulls, crows, raccoon, skunk, fox, coyote, and opossum will be attracted to the area to feed on garden plants, compost piles, and garbage left by residents and their guests. The availability of these food items is likely to increase the number and density of predators using the Property.

The extent of these adverse effects will be minimized, however, by the conservation measures specified in the HCP and required by the ITP. The measures are summarized in Table 2; see the HCP for further description of the measures. The measures to minimize human disturbance to plovers include restrictions on the following: construction activities, beach use, pet control, motorized vehicle use, and dune vegetation alterations. Measures required to minimize disturbance from potential predators include: a predator control program, if needed, garbage control restrictions, and limitations on building activity platforms, towering structures, and satellite dishes. In short, these measures in concert will reduce the frequency of foraging interruptions, decrease unnecessary energy expenditure, and minimize exposure to predators.

The homeowners association created by the Magic Carpet Woods Development Master Deed and referenced bylaws will implement these conservation measures as required by the ITP and the IA. The Association will have a single point of contact for interaction and information exchange with the Service. The Association will also use its regulation adopting power to enact the conservation measures called for in the HCP that are not yet incorporated into the Master Deed and Association Bylaws. Participation in the Association will be required through the deeds associated with each lot.

Furthermore, lot owners are required to advise all visitors, renters, and lessees of the plover protection measures and restrictions in the HCP and related documents, including the Master Deed and Association Bylaws. Lot owners will have ultimate responsibility for ensuring visitors, renters, and lessees comply with measures contained in these documents.

The Association will also ensure that an on-site steward is present to aid in creation and maintenance of nest exclosures, discourage human, pet, and predator activities near nest sites, and help educate homeowners of plover issues if plovers are observed nesting on or within 0.5 miles of the Property. Piping plover nests found on the Property will be accorded the same protection from disturbance and predation provided to nests on public property in the Great Lakes region. This protection includes construction of nest exclosures to deter predation and psychological fencing to deter human activity. The success of such measures has been documented rangewide. Consistent use of exclosures and psychological fencing, for example, has improved hatching success from 37 to 70% in the Great Lakes.

Therefore, we anticipate that given full compliance with these HCP measures, adverse effects will be substantially minimized and plover productivity will not be hindered.

In previous correspondence (November, 11, 1998) with Mr. Petty, we indicated that the proposed project would also directly impact plovers nesting on the State Park. Specifically, we stated that the project would (1) disturb breeding behaviors during construction, and (2) increase human, pet, and scavenger presence at the State Park. The November 11, 1998 correspondence was predicated on the Magic Carpet Woods project taking place without an approved conservation plan. For reasons discussed here, such effects are unlikely. First, as there is a half-mile or more between construction activities and nesting habitat at the State Park, it is unlikely that construction related noise and activities will disrupt plover behavior at the State Park. The likelihood of serious disturbance of piping plovers by house construction noise may be overstated. Piping plover adults with chicks were observed (M. DeCapita, USFWS, pers. obs.,

Table 2. Conservation measures identified in the draft EA/HCP

Minimization Measures	**Description**
Construction Activities	Major construction activities will be completed prior to removal of trees and shrubs lying between construction activities and the shoreline. During the nesting/breeding season, the lot owner is required to inform any contractor and all employees that they are not allowed on the beach, no pets are allowed at the construction site, and all trash and garbage must be properly disposed of in secure containers.
Beach Use	During the critical nesting[1], picnics will not be allowed on the beach if nesting is known to occur within 0.5 miles of specific lots unless the picnic area is promptly cleaned up and policed at the conclusion of the picnic. No picnics or any unauthorized activities are allowed in a fenced nesting area.
Pet Control	All pets must be restrained or under direct control (i.e. with electric or invisible fencing) at all times, and must be leashed when on the beach during the critical nesting period. Stray dog sightings will be immediately reported to appropriate animal control or law enforcement entities.
Dock Construction	Construction of docks within Lake Michigan will not be permitted
Motorized Vehicle Use	Off-road vehicles or any other motorized vehicles will not be permitted in the active dune area or beachfront at any time.
Predator Control	Mammalian predators that pose a threat to plovers in the Property vicinity
Garbage Control	Garbage will be placed in covered animal-proof containers that will be stored year-round in an area within the forest. Garbage or unenclosed food will not be left unattended along the shoreline.
Structures	Towering structures such as flagpoles, antennas, and satellite dishes are not allowed within the shoreline area. Activity platforms --for grills, picnic tables, etc.--are not allowed along any portion of the shoreline. No satellite dishes are allowed from the shoreline through the open dune area. No bird or animal feeders are allowed in the shoreline through open dune area.
Vegetation Alteration	Removal or planting of vegetation in the active dune area is prohibited. Vegetation alteration within an 80-foot setback area will be limited to removal of fallen, dead, diseased or dangerous trees, and selective trimming of trees to provide a filtered view of the water.
Nest Protection	Predator exclosures and psychological fencing (to prevent human entry) will be placed around all known plover nests. The closed, fenced area will extend about 100 m beyond each nest and parallel to the shoreline and from the toe of the foredune to the waterline. During the approximately 30-day period a nest is being incubated, human traffic may pass the nest by walking between the lake waterline and the fencing.

[1]critical nesting period = end of April to end of June or until all piping plover chicks hatched from nests or within ½miles of the project property are 35 days old

June 13, 2000) on the Emmet County Cross Village Shores (a densely developed residential beachfront community) beach in full view and sound of noisy house construction (hammering, electric saw) in open (unforested) dune. Plovers appeared undisturbed during about 45 minutes of observation. One chick later fledged from this nest. Construction activities on the Property will occur three-fourths mile from the State Park and will be visually hidden by trees. Sound, if any reaches that distance, will be muffled by the heavy forest cover. It is unlikely that resultant noise will be disruptive to birds nesting at the State Park. Second, regardless of whether the project causes increased human or pet use at the State Park, we do not anticipate that plovers will be adversely affected because of the stringent protection measures employed and enforced by the Park. As explained in the Environmental Baseline section, these measures have been successful in protecting nesting plovers. It is very unlikely that use of the State Park would increase to the extent that the efficacy of these measures is compromised. Furthermore, the HCP restricts human and pet beach activities if nesting is known to occur within 0.5 mile of the Property. Thus, there is even less likelihood of activities on the Property disturbing plovers nesting at the Park.

Summary - With completion of the proposed project, use of the Property's beach area may be more intense and consistent. As such, the salient issues are disturbance, injury or death of piping plovers caused by humans, uncontrolled pets, or natural predators. However, the proposed conservation measures will restrict beach use so that the adverse impacts on the piping plover and its proposed critical habitat will be minimized to the extent that plover productivity will not be impaired. Furthermore, these measures, if fully implemented, should assist in eliminating the unauthorized disturbances that are currently occurring, and thereby possibly improving the suitability of the site. Proposed critical habitat is not likely to be destroyed or adversely modified. The ability of Cathead Bay to contribute to the survival and recovery of the Great Lakes piping plover population is not likely to be compromised by the project with the ITP terms and conditions in place.

Effects of the action on Pitcher's thistle

As construction of homes will be restricted to the forested portion of the Property, no direct impacts are anticipated. Beach access and activity could result in the incidental trampling of plants; however, walkway structures will be constructed or designated pathways will be used to minimize disturbance. Further, we anticipate that the awareness of the HCP and its intended purpose will alert beach users of the threatened status of this species. Thus, we expect very little foot traffic in thistle areas. More importantly, planting of vegetation within the active dune area will be prohibited. As plantings are the most pervasive method of Pitcher' thistle habitat modification, this measure will ensure that the critical dune processes, which create and maintain thistle habitat, will not be altered. It is likely that some adverse impacts will not be eliminated and that a few individuals may be incidentally destroyed or injured. However, we do not anticipate that these effects will reduce the overall habitat quality of the Property.

CUMULATIVE EFFECTS

*Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the **action area** considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.*

As explained in the Environmental Baseline section, all of, except the Property, Cathead Bay shoreline is developed or protected. Other than minor adjustments to existing structures, the Service is not aware of any State, tribal, local or private actions that are reasonably certain to occur on Cathead Bay.

CONCLUSION

After reviewing the current status of piping plover, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the action as proposed is not likely to jeopardize the continued existence of the piping plover and is not likely to destroy or adversely modify proposed critical habitat. It is also, our biological opinion that the proposed action is not likely to jeopardize the continued existence of Pitcher's thistle. As no critical habitat has been designated for Pitcher's thistle, none will be affected.

The proposed project may result in adverse effects to individual birds using the Property. We anticipate that temporary non-compliance with the conservation measures identified in the HCP and ITP could occur. Although the ITP and IA stipulate measures to remedy such non-compliance, it is possible that nesting and foraging activities could be temporarily disrupted. We do not anticipate that this will noticeably affect the productivity of the plovers using the Property. Thus, we do not believe the proposed project will decrease the conservation status of the local Cathead Bay, and thus the Great Lakes, piping plover population. That is, the proposed project is unlikely to appreciably reduce the likelihood of survival and recovery of the Great Lakes piping plover.

Similarly, we do not anticipate that the proposed project will adversely affect the viability of the Cathead Bay occurrence of Pitcher's thistle. Cathead Bay is an essential component to the overall recovery and survival of the Pitcher's thistle. Although individual plants may be injured or destroyed, the proposed conservation measures will minimize detrimental impacts. Specifically, boardwalk construction and lot owner awareness will reduce trampling. Restrictions regarding vegetation planting ensure that the dynamic dune processes that create and maintain Pitcher's thistle habitat will not be altered. Therefore, we believe that the proposed project will not adversely affect the Cathead Bay population, and thus, will not appreciably reduce the likelihood of survival and recovery of the Pitcher's thistle.

The proposed project is unlikely to adversely modify or destroy proposed critical habitat. There will be no physical modification of habitat, although human disturbance will occur. Some adverse effects may occur and the "low level of disturbance" PCE could be exceeded; however, these adverse effects will not compromise the value of the proposed critical habitat unit. That is, the Project will not (1) hinder nesting success at the Park or (2) prevent other areas from becoming suitable nesting sites. As the project will not slow progress toward recovery or reduce the overall capacity of the proposed critical habitat unit to support current or increased numbers of piping plovers, the proposed project will not adversely modify or destroy proposed critical habitat.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of the Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Service so that they become binding conditions of any grant or permit issued to the Association, as appropriate, for the exemption in section 7(o)(2) to apply. The Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Service fails to (1) assume and implement the terms and conditions or (2) require the Association to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Association must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed endangered plants or the malicious damage of such plants on areas under Federal jurisdiction or the destruction of endangered plant on non-Federal areas in violation of State law or regulation or in the course off any violation of a State criminal trespass law.

Amount or extent of take anticipated

Although we do not believe incidental take will occur if there is full compliance with the conservation measures stipulated in the ITP and HCP, breaches in compliance are probable. Despite the possibility of non-compliance and possible adverse effects, it is likely that such effects would happen rarely and would result in a low level of incidental take. The reasons for this are as follows. As explained in the Effects section of this biological opinion, the conservation measures proposed in the HCP have been consistently applied and highly successful at numerous piping plover sites rangewide. We have no reason to believe these measures would be any less effective here. In fact, as these measures will become mandatory bylaws, it is reasonable to assume that lot owners will be even more cognizant and likely to adhere to the conservation measures. Furthermore, the presence of the steward will serve as a

frequent reminder of piping plover and an additional deterrent for violating of the conservation measures. Finally, the HCP provides compliance monitoring and corrective action processes, which will identify and remedy non-compliance incidences promptly. Thus, if non-compliance should occur, it may result in temporary, short-lived disruption or disturbance of piping plover activity but rarely cause injury.

If incidental take should occur, it is expected in the form of harassment of nesting or foraging birds. For example, failure by a few residents to adhere to the psychological fencing or employment of fireworks on the beach may cause plovers to exhibit more alarm behavior, increase energy expenditure, and have less opportunity to feed throughout the incident. Incubation could be prolonged or chick growth rates (especially if the events occurred during the first two weeks following hatching) could be slowed and time-to-fledging extended.

Although it is difficult to predict the exact frequency in which incidental take will occur, we do not anticipate it to occur more than once every 3 years. On-site monitoring will assist in gauging the accuracy of this measurement. As individual birds have differing tolerances for disturbances, detecting harassment is difficult. To accommodate for this difficulty, we will assume that all occasions where a conservation measure is violated and piping plovers are noticeably disturbed, a take has occurred.

Note: Only take that is lawful pursuant to the ITP is exempted under this Incidental Take Statement. That is, provided the applicant and respective lot owners adhere to the conservation measures or follow the corrective action process, any take that results from their activities is lawful take under the ITP and is exempted here. Take associated with activities specifically prohibited by the ITP/HCP (e.g., unleashed pets) or that occurs in conjunction with failing to comply with the corrective action process is not authorized under the ITP. Such take is unlawful, and is therefore not "incidental take" and is not exempted under Section 7.

Effect of the incidental take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of proposed critical habitat.

This level of incidental take will not reduce productivity to the point that the conservation status of the Cathead Bay population declines. Thus, the likelihood of survival and recovery of the Great Lakes piping plover population will not appreciably affected.

Reasonable and prudent measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of piping plovers.

1. The Service will ensure the Applicant clearly identifies and explains the conservation measures in the HCP to each current and future lot owner.

2. The Service will provide and require the Applicant to distribute and promote educational materials about the piping plover.

3. The Service will require compliance monitoring to ensure adherence to the conservation measures.

Terms and conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The Service will, through enforceable terms and conditions, require the Applicant to ensure through written correspondence that all current and future lot owners are aware of the conservation measures identified in the HCP and their responsibilities and liabilities for abiding by these measures.

2. The ELFO will provide informative materials to the Applicant within two months of issuance of the ITP. The materials will include information about piping plover biology, threats, and conservation status. Such information should include a positive message so residents understand and appreciate the importance of complying with the HCP measures.

3. The Service will require, through terms and conditions of the ITP, the Applicant to ensure all current and future lot owners receive copies of the educational literature.

4. To ascertain the rate of non-compliance and to assess the level of disturbance associated with such violations, the Service will include a term and condition requiring compliance monitoring. The monitoring methodology will include specific protocols for reporting the number and the effect of such violations.

The Service believes that no more than 1 harassment incidence every 3 years will occur as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

The Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (U.S.C. §§ 703-712) if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

LITERATURE CITED

Cairns,W.E. 1977. Breeding biology of piping plover in southern Nova Scotia. Masters Thesis. Dalhoussie University, Halifax, Nova Scotia. 115 pp.

Cotrille, B.D. 1957. Summer distribution of the piping plover in Michigan. Jack-Pine Warbler 35:26-33.

Cuthbert, F.J. *in litt*. 25 June 1998 letter to Leelanau Township Planning Commission regarding comments on Mr. Frank Petty's request for Density Transfer for Magic Carpet Woods, section 14 Leelanau Township, Leelanau Co., Michigan.

_____. *in litt*. 2 March 1999 letter to Mr. Rick Whitney, NES, regarding comments on the Magic Carpet Natural Resources Preservation and Protection Plan (February 1999).

_____. *in litt*. 7 February 2000 letter to Mr. Mike DeCapita, U.S. Fish and Wildlife Service, regarding comments on the Magic Carpet draft EA/HCP.

_____. *in litt*. 12 December 2000 letter to Ms. Jennifer Szymanski, U.S. Fish and Wildlife Service, regarding the conservation status of piping plover in Michigan.

Hatt, R.T., J. Van, L.C. Stuart, C.H. Pope, and A.B. Grobman. 1948. Island life: A study of the land vertebrates of the islands of Lake Michigan. Cranbrook Press, Bloomfield Hills, Michigan.

Michigan Natural Areas Council. 1978. Cathead Bay Site Report. Michigan Department of Natural Resources, Lansing, Michigan. 4 pp.

Michigan Natural Features Inventory (MNFI). 1999a. Management of the piping plover: Study Performance Report, 1998 – 1999. Michigan's Endangered and Threatened Species Program. Lansing, Michigan. 4 pp.

_____. 1999b. Element Occurrence Record for Pitcher's thistle, September, 9, 1999. Lansing, Michigan. 1 pp.

Pavlovic, N.B., M.L. Bowles, S.R. Crispin, T.C. Gibson, K.D. Herman, R.T. Kavetsky, A.K. McEachern, and M.R. Penskar. *in litt*. 2000 letter to Mr. Mike DeCapita, U.S. Fish and Wildlife Service, regarding the recovery of Pitcher's thistle.

Plissner, J.H. and S.M. Haig. 2000. Metapopulation models for piping plovers *(Charadrius melodus*). Biological Conservation 92:163-173.

Stucker, J.H. *in litt*. 12 October 2000 letter to Ms. Jennifer Szymanski, U.S. Fish and Wildlife Service, regarding population numbers of piping plover in Michigan.

_____. *in litt*. 4 December 2000 letter to Ms. Jennifer Szymanski, U.S. Fish and Wildlife Service, regarding the conservation status of piping plover in Michigan.

_____., E. W. Price and F. J. Cuthbert. 2001. Piping plover breeding biology and management in the state of Michigan, 2000. University of Minnesota. St. Paul. Unpublished report submitted to Mich. Dept. of Natural Resources, Lansing, Michigan and U.S. Fish & Wildlife Service, East Lansing, Michigan. 28 pp.

_____. and F.J. Cuthbert. 1999. Piping plover breeding biology and management in the State of Michigan, 1999. Unpublished report to Michigan Department of Natural Resources, Lansing, Michigan. 26 pp.

_____., L.C. Wemmer, and F.J. Cuthbert. 1998. Piping plover breeding biology and management in the State of Michigan, 1998. Unpublished report to Michigan Department of Natural Resources, Lansing, Michigan. 22 pp.

U.S. Fish and Wildlife Service. 1991. Pitcher's thistle, *Cirsium pitcheri*, Recovery Plan. Technical/Agency Draft. Fort Snelling, Minnesota. 111 pp.

_____. 1994. Draft revised recovery plan for piping plover, *Charadius melodus*, breeding on the Great Lakes and northern Great Plains of the United States. U.S. Fish and Wildlife Service, Region 3, Twin Cities, Minnesota.

_____. 1996. Piping plover (*Charadrius melodus*), Atlantic Coast Population, Revised Recovery Plan. Hadley, Massachusetts. 258 pp.

Voss, E. G. 1996. Michigan Flora: A Guide to the Identification and Occurrence of the Native and Naturalized Seed-Plants of the State. Part III. Dicots (Pyrolaceae-Compositae). Vol. Bulletin 61. Cranbrook Institute of Science and University of Michigan Herbarium, Bloomfield Hills, Michigan. 622 pp.

Wemmer, L.C., A.W. Doolittle, and F.J. Cuthbert. 1995. Piping plover breeding biology and management in the State of Michigan, 1995. Unpublished report to Michigan Department of Natural Resources, Lansing, Michigan. 21 pp.

Wemmer, L.C., S.T. Freirer, and F.J. Cuthbert. 1997. Piping plover breeding biology and management in the State of Michigan, 1997. Unpublished report to Michigan Department of Natural Resources, Lansing, Michigan. 25 pp.